CUTEC News

GUEST EDITORIAL
"Regional cooperation"

Dear Reader,

'Region' and 'Cooperation' are words with positive connotations. Their definition is a cause of some dispute however. The ideas and practical embodiments of those keywords in terms of communal approaches are many and varied. The expectation of added value to be gained from cooperation on a regional level is also reflected in the establishment of regional development offices and in the deployment of regional commissioners by the state government. As cross-departmental state authorities, the four offices are a key interface between the state government and the local municipal authorities and other stakeholders with regional responsibility. Together with their regions and the stakeholders in them, they have devised and unanimously passed regional policy strategies. The strategies are linked to open processes. They guide action, and are being continually enhanced through discussion processes. Their orientation to regional development is key. Who would have thought that stakeholders from different local and district authorities would agree on a joint strategy!

The aim of the state government is to eliminate disparities resulting from factors such as demographic trends and varying economic structure around the state. The Southern Lower Saxony Programme, which marked its first anniversary in February 2016, demonstrates the success and dynamism which regional cooperation can achieve when the state and the region are all pulling in the same direction. The stakeholders in southern Lower Saxony have developed some 150 ideas for projects. 60 of them have proved feasible, and are to be pursued further. The region is being supported in its efforts by the Southern Lower Saxony Project Office. That body's mission, as a regional development agency, is to suggest, take up and advise on projects from around the region. In this, too, the state and region are working hand-in-hand. The office's staff are delegated from the state as well as from the five administrative districts and the municipality of Göttingen. Funding of 7.4 million Euro has already been approved as part of the Southern Lower Saxony Programme.

Intelligent, sustainable and integrated growth in the regions requires cooperation, good ideas – and the right funding. A particularly boon in this respect is the cooperative multi-fund approach of the current EU funding period 2014-2020. The European Regional Development Fund (ERDF), European Social Fund (ESF) and European Agricultural Fund for Rural Development (EAFRD) offer the resources to drive just, balanced development tailored to actual regional needs. The challenge of the new funding period is to deploy the declining financial resources where they will have maximum impact. This demands engagement beyond village and town borders, in the form of regional cooperation.

After two-and-a-half years' work, I can see the region is on the right track. I see good approaches to regional cooperation in entities such as the Braunschweig Local Steering Committee and the Southern Lower Saxony Steering Committee, and in the interlinking of specialist skills through the Alliance for the Region and the Southern Lower Saxony Foundation. Local authorities are working together in renovating rural villages and in the promotion of urban development. LEADER groups are engaged in promoting their regions. And cooperation between science and industry is also growing.

The CUTEC Institute likewise works on issues at the intersection of science and industry, so also embodying the concept of interconnectedness and cooperation with a variety of initiatives and large number of partners, and ultimately benefiting the region with applications-oriented research.

I hope you, dear reader, will be inspired with lots of ideas for future regional cooperation, and I send you all my best wishes from Braunschweig

Sincerely, Matthias Wunderling-Weilbier
State Commissioner for Regional Development

CUTEC is a Company of the State of Lower Saxony

DR. LINDERMEIR AWARDED THE 2016 TEACHING PRIZE OF THE TECHNICAL UNIVERSITY OF CLAUSTHAL

At the Academic Awards Ceremony on April 22, 2016, Dr. Andreas Lindermeir, Head of the Department of Chemical Energy Systems, was presented with the Teaching Prize of the Technical University of Clausthal in recognition of his "Chemical energy stores and systems" teaching concept. The lecture series was launched in the Winter 2014/15 semester as part of the masters course in Energy and Material Physics by the Institute of Energy Research and Physical Technologies, and considers the current challenges of energy storage within the context of the shift to renewables.

The lectures provide students with a comprehensive package of technical and scientific, methodological and social skills as well as conveying a systemic understanding of the energy system. In didactic/methodological terms, the teaching concept is based on students' active participation in modular, interlinked subject blocks. Reflection on the issues and independent working on relevant substance accounts for a major portion of the lecture contents.

Photo: Rotschiller

Picture caption: Recognised for his high teaching standards: Andreas Lindermeir (centre)

The student jury praised the concept expressly for its holistic approach to skills teaching and its focus on the requirements of the students' future career fields. They particularly highlighted the sustainability of the project and its highly skill-oriented examination. Learning is placed at the core of the concept, and the students' active participation is encouraged.

Dr. Lindermeir has been a lecturer at the Technical University of Clausthal since 2012. In addition to his Chemical Energy Stores and Systems lecture series he also offers a course on Fuel Cells and Electrochemical Energy Converters. (li)

BMBF REWITA PROJECT ATTRACTS HIGH MEDIA INTEREST NATIONWIDE

The start of sample drilling for indium and other industrially key strategic metals contained in the sludge of the ponds at the Rammelsberg ore mine in Goslar as part of the REWITA project elicited a media fever throughout Germany. REWITA forms part of the German Federal Ministry of Education and Research (BMBF) funding scheme "r⁴" - Innovative technologies for resource efficiency – Research for the provision of industrially key strategic raw materials".

Based on reports in almost all major newspapers in the state, and a flood of inquiries, a media visit to the Bollrich site was arranged. The NDR, SAT.1 and RTL Nord television channels presented news features on it. Broadcaster Pro 7 featured the recovery of an estimated 100 tonnes of indium, 180 tonnes of gallium and other metals from the residues of ore processing – including some 1.5 tonnes of gold – in its science programme "Galileo". The more than one million tonnes of barite in the ponds are also economically significant.

Project coordinator Dr. Torsten Zeller (CUTEC Department of Metal Recycling), Prof. Daniel Goldmann (Department of Raw Material Reprocessing and Recycling, Technical University of Clausthal) and Prof. Norbert Meyer (Institute of Geotechnology and Mine Surveying, Technical University of Clausthal) presented the innovative project.

"It impacts on a European level. Gaining greater independence from international key commodity markets is of vital importance. Without those raw materials state-of-the-art technologies will no longer be viable," explained Matthias Wunderling-Weilbier,

The ponds at the Bollrich mine site hold the metal treasures which drew the media reports

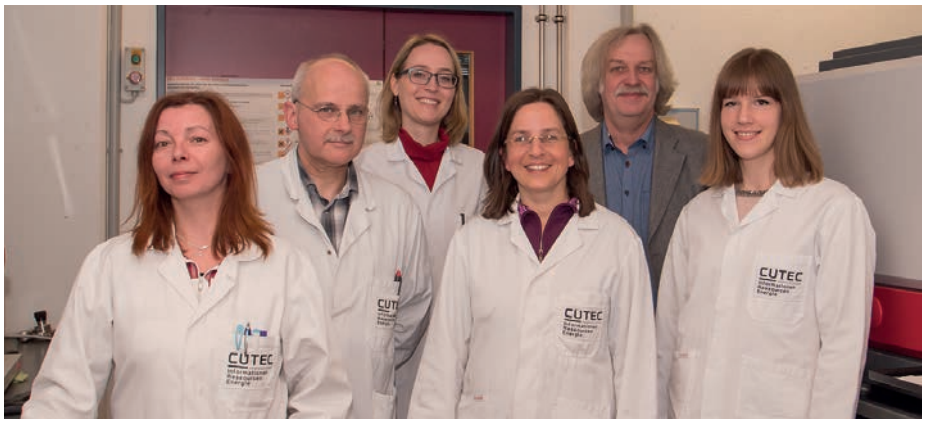
State Commissioner for the Braunschweig [Brunswick] region.

Participants in the project to recover the 'treasures' are: PPM Pure Metals GmbH, Stöbich Holding, pdv-Software GmbH, Harz-Metall GmbH, and Prof. Burmeier Ingenieurgesellschaft mbH. Bergbau Goslar GmbH is supporting the research project as an associate partner.

The significance of the project in advancing the region's progress to becoming the 'Silicon Valley of Recycling' was also highlighted by Mayor of Goslar Dr. Oliver Junk, deputy district administrator (Landrat) Horst Brennecke, and members of the state parliament Petra Emmerich-Kopatsch and Alexander Saipa. (be)

THE DEPARTMENT OF CHEMICAL ANALYSIS

Service provider to the CUTEC Institute



The Department of Chemical Analysis team

The four lady and two gentlemen members of the CUTEC Institute's Department of Chemical Analysis are keen not to refer to themselves as 'analysts'; they see their role as providing our clients with robust results from the real world rather than proposing investment strategies.

So the following is a brief overview of our skills and capabilities. Maybe we will be able to assist you too?

One day detecting tar and hydrogen sulphide content in process gases; another conducting element and calorific value analyses of biogenic residues and, in among, measuring the heavy metal content in computer circuit boards and mobile phones. The wealth of projects handled by the CUTEC Institute entails wide-ranging challenges for the Department of Chemical Analysis. The tasks involved in chemical analysis vary widely, though the selection and adaptation of suitable methods is a constant necessity. So it certainly never gets boring for the experienced staff of the Department of Chemical Analysis. Especially in view of the fact that our portfolio is continually being expanded, and we long since ceased to be merely a highly regarded internal service provider. An increasingly important part of our team's work is direct cooperation with clients from the private sector looking to investigate just what it is, internally, that holds the world together. That 'world' might be gaseous, liquid or solid, and reveal itself in thousands of different guises:

Example – gas analysis:
It will not be conceivable to advance electromobility without developing ever more efficient and safe batteries. We assist the safety testing of such high-performance batteries by analysing the smoke and low-temperature carbonisation gases occurring in the stress tests. Don't want to blow a battery apart, but still want to know what's inside it? We will handle the job for you, visiting you on-site, and also collecting samples of your air to check it!

Searching for trace ions

Example – water analysis:
Natural resources of phosphorus are finite. Intelligent recycling processes are helping recover this essential element and conserve its natural stocks. We assist in detecting phosphorus and other element content. Not interested in detecting phosphorus, but fed up with process water and condensate corroding your plant? We will check what's making your water so aggressive, and soothe it!

Example – solids analysis:
Rare earths are neither rare, nor earths, and since they have recently dropped in price they are no longer such a hot topic – though everyone comes into contact with them all the time. These valuable metals are nowadays essential components in many electronic products such as mobile phones and laptops. We will shred your electronic scrap and tell you what's worthwhile extracting from it. Not interested in exotic stuff like that, but having problems with scaling and deposits on or in your plant? We will tell you where they come from, and how you can get rid of them!

Yes, we do of course also work to standard procedures, directives and norms. But what makes us special is a highly motivated, experienced team of technical assistants, a chemical lab technician trained within the department, and a graduate chemist. We are additionally able to call upon the concerted engineering know-how of the various process departments of the CUTEC Institute. Because prior to analysing your samples, the focus is always on understanding your technical process and plant. These preliminary consultations almost always result in a reasoned and tighter selection of samples and parameters to be investigated. One we have identified them for you, we will not just leave you alone with the resultant graphs and figures. Instead, our standard approach, complementing the test report, involves a detailed discussion of the results. It is often only on this basis that the conclusions leading to successful modification of your production process or parameter settings can be drawn.

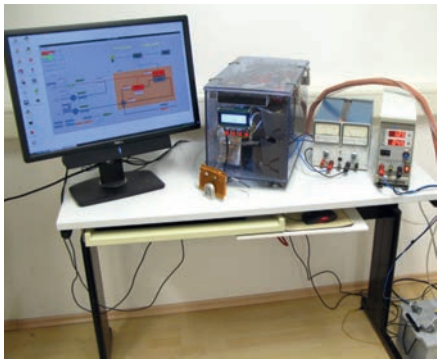
Is the solution right?

We will be glad to investigate your problem in order to make your process and plant more efficient, environmentally friendly and cost-effective based on chemical analysis. So in that respect we do, in fact, provide you with an investment strategy. (fi)

PROJECT CONCLUSION

EU SAPIENS fuel cell project

The EU SAPIENS project was sponsored in the framework of the Fuel Cell and Hydrogen Joint Undertaking (FCH JU). After running for 36 months, it was completed successfully on October 31, 2015. SAPIENS stands for SOFC Auxiliary Power In Emissions/Noise Solution. The aim of the project was to develop a LPG (liquefied petroleum gas) powered fuel cell electricity generator and integrate it into a mobile home built by British manufacturer Autosleepers Ltd. The special feature of its vehicles is an underfloor LPG tank, eliminating the need for the otherwise standard-issue camping gas cylinders. This means customers are able to fill up with LPG at a filling station, avoiding the nuisance of having to change gas cylinders.



Laboratory set-up of the fuel cell power generator for the endurance test

The fuel cell stack based on a tubular high-temperature fuel cell (Solid Oxide Fuel Cell, SOFC) was developed by British start-up ADELAN Ltd., who also coordinated the project.

The CUTEC Institute was involved in a number of work packages. First, it analysed the composition and sulphur content of gas samples from LPG filling stations in Poland, Spain, the UK and Germany. LPG is naturally odourless. In order to detect possible leakage, a sulphur-containing odourising agent is added. The sulphur components are extremely harmful to the catalytic converters fitted in the fuel cell system, and so must be removed beforehand. It was shown that the composition and sulphur compound content fluctuate widely depending on the filling station, the time of year, and the fill level. Based on the analyses, CUTEC designed a sulphur descending to protect the fuel cell. The

Installation of the SOFC power generator in the mobile home

design assumed a minimum service life of one year, which means the component can be replaced in the course of the routine annual service.

Reflecting the CUTEC team's years of experience in the construction and operation of fuel cell systems, a power- and space-saving control unit was developed in a further work package. It is based on a Raspberry Pi microcomputer, fitted with input/output module to measure the operating characteristics and control the plant parameters. The development interface and the operating modes automatically adapting to power consumption were programmed in the Python programming language. The stability and functionality of the hardware and software was demonstrated in a 10-day endurance test, in which a pre-programmed test cycle simulated charging and discharging operations in a mobile home.

Mobile home fans like to enjoy the quiet of nature! Consequently, an interior-fitted power generator is subject to stringent noise emission limits. CUTEC built and tested a special sound-insulated housing for the fuel cell system. Sound-pressure level measurements at the operating point proved that noise emissions were well below the limit value of 30 dB(A).

The housing additionally protects the sensitive components against shock impact and vibration damage. Spring-and-damper mountings enabled impacts to be translated into damped oscillations, greatly reducing the load on the components.

Another element of CUTEC's work involved drawing up a so-called HazOp (Hazard and Operability) safety study. This analyses the plant process flow diagram to assess the influence of a malfunction in one or more components on safety for humans and the environment.

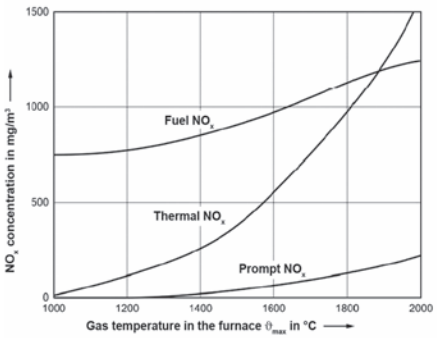
On conclusion of the laboratory tests, the generator was integrated into a mobile home and the noise emissions and damping characteristics were checked in a field trial. In parallel, the project partners fitted out a mobile home with a fuel cell system and subjected it to extensive testing. The test and demonstration drives in Clausthal and in England, Scotland and Ireland marked the successful conclusion of the project. (sz)

Test vehicle and test drive route (>1000 km) concluding the project

REDUCTION OF NITROGEN OXIDES

An issue not only for motor vehicles

The nitrogen oxides issue has become a focus of public concern as a result of the emissions scandal involving manipulated software for diesel vehicles in the USA. Three compounds in the substance group are of particular importance: NO (nitrogen monoxide), NO_2 (nitrogen dioxide) and N_2O (dinitrogen monoxide – 'laughing gas'). The gases can be created in combustion processes, with the air or fuel as potential sources. The related processes are heavily dependent on temperature (diagram bottom left). The biochemical effects and the promotion of fine dust pollution in urban conurbations are harmful to humans and to plant life; N_2O is being included in considerations for tightening emission limits based on its threat to the climate (boosting the greenhouse effect; degrading ozone in the stratosphere).



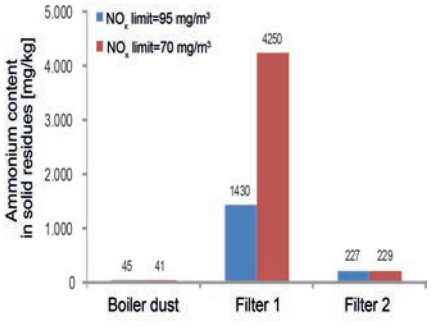
NO_x formation as a function of maximum gas temperature in a pulverised coal fired furnace[1]

The Department of Thermal Processes has been working on the issue ever since it was established. Under the leadership of Prof. Carlowitz, R&D projects relating to exhaust gas cleaning became so numerous that they were even assigned a dedicated working group. Following the conclusion in October 2014 of a major research project into nitrogen oxide reduction in coffee-roasting plants, funded by the German environmental foundation Deutsche Bundesstiftung Umwelt and carried out in cooperation with the private company Luft- und Thermotechnik Bayreuth GmbH, the amendment to Germany's 17th Federal Immission Control Regulation (BImSchV) entailed new demand for action on the part of waste incinerator operators, who in future will have to comply with more stringent emission limits. Further changes to limits are possible in the course of the currently ongoing Sevilla process, which entails a Europe-wide revision of BREFs (Best Available Technique Reference Documents).

FTIR to measure gas constituents in mixtures

The CUTEC Institute has expanded its facilities to support incinerator operators with regard to the measurement of concentrations in flue gases. Facilities have been enhanced by the integration of the personnel and equipment of the former §26 measuring unit into the Department of Thermal Processes as well as by technical upgrades, such as a second FTIR analyser (diagram top centre).

Those enhancements have been financially measurable in large volumes of measurement commissions since 2014, as well as the "Ammonia Masking in SNCR Plants" project sponsored by the VGB research Foundation which runs until the end of 2016. The high levels of interest in the results are already being reflected in requests for publications. As examples: the technical journal "VGB PowerTech" printed a detailed feature in its May issue, and at the VGB conference on Thermal Waste Treatment the results will be set forth in a presentation by an invited speaker. The scientific evaluations of measurements at six waste incineration plants and refuse-derived fuel power plants reveal interesting interactions of NOx formation and ammonia slip with other gas constituents. The project will significant enhance knowledge. It is, however, also becoming clear that excessive lowering of the NO_x limit increasingly drives the reductant into the waste gas purification residues. A waste gas problem then becomes a solid problem, as a result of which the actual point of emissions reduction might well be missed (diagram bottom right). The project thus has not only technical and scientific aspects; it will also contribute to potential further political discussions on more stringent NO_x emission limits for waste incineration plants. Over the coming years it is to be expected that dinitrogen monoxide will increasingly become the subject of observations. Further R&D will be required in order to achieve reliable analysis in gases with large numbers of constituents. The CUTEC Institute is ready to meet that challenge. (vo)



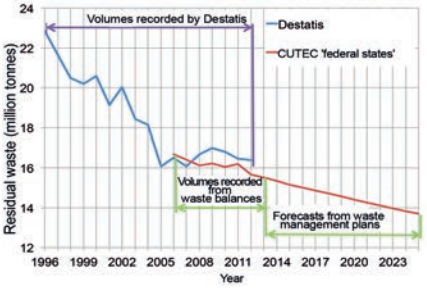
Increased ammonium content with reduced NO_x limit

[1]Beckmann, M., Umweltbundesamt Texts 71/2001 (2011)

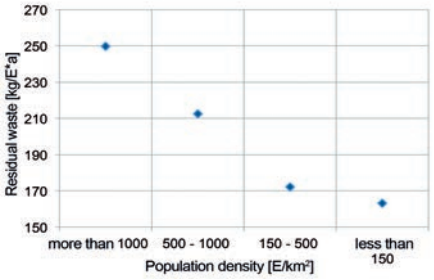
ECO-FRIENDLY UTILISATION OF NON-ESTABLISHED MATERIAL FLOWS IN WASTE INCINERATION PLANTS

The thermal treatment of municipal waste has a long tradition, extending back to the commissioning of the Bullerdeich waste incineration plant in Hamburg in 1896. There was public opposition right from the launch of its operations: noise during transportation of the waste (caused by the horse-drawn carts), extraction of reusable materials (at the time fertiliser), and a claimed lack of demand were the main issues. After a number of cholera epidemics, however, the Hamburg city-state parliament passed the planning consent to build the facility based on the need to hygienise non-recyclable municipal waste. Many municipalities followed suit over the next decades. Continuous technical development has led to the modern-day low-emission waste-fed heating and power plants, which are capable of generating electricity, process steam and distant heat in addition to thermally treating waste. The plants must meet the demands of life-cycle management of reusable materials. As a result, the composition of the waste is also changing over time.

In order to determine the current status quo and identify future prospects, in 2014 the German Federal Environmental Agency launched a competitive tender for the execution of a survey. The tender submitted by the Department of Thermal Processes in conjunction with the Fraunhofer Institute for Environmental, Safety and Energy Technology UMSICHT, Institute Branch Sulzbach-Rosenberg, was successful. The project began on October 1, 2014 and ended on November 15, 2015. It considered the effects of European and German legislation also on non-waste areas such as the energy sector and social trends such as increasing urbanisation.



Forecast residual waste volumes according to the waste balances and waste management plans of the German federal states [1,2]



Specific residual waste volume as a function of population density

Based on evaluation of the waste management plans of all Germany's federal states, the volumes of 'traditional' municipal waste to be thermally treated by public-sector waste management services by 2015 will decreased to a value of approximately 13.7 million (diagram left). Legal measures to promote material recycling, such as amendment of trade waste disposal regulations, establishment of comprehensive organic waste collection and the introduction of domestic recycling bins will further enhance life-cycle management. Interestingly, however, the Europe-wide striving for improved material utilisation is itself leading to new material flows for thermal treatment. A notable factor is the prohibition on landfill dumping which is gradually being implemented in the EU. Pre-processed refuse-derived fuels are being brought to Germany for use in specialist power plants owing to a lack of capacity in the source countries. Another factor is the water conservation policy introduced as part of the German federal government coalition agreement, which plans to ban the use of sewage sludge as agricultural fertiliser with effect from 2025. Laws relating to the shift to renewables (the 'Energiewende') in Germany will also bring new material flows onto the market, such as refuse-derived fuels from coal-fired power plants.

The ever-decreasing landfill capacity in Germany is leading to increased recycling of materials that were previously dumped. Consequently, the continually technically upgraded processing at mechanical/biological plants might lead to a reduction in landfill dumping volumes, linked to a fraction for thermal recovery. Improved processing of mixed construction waste will in future force low-calorific value volumes onto the disposal market. All of this is creating potential for thermal recovery which will be able to compensated for the decline in 'traditional' volumes for thermal treatment at refuse-derived fuel power plants. Alongside the legal effects, social changes also need to be considered. Urbanisation – that is to say, the tendency of people to live in and around towns and cities – has been rising steadily in Germany for years. Forecasts predict that the trend will continue. But – as the evaluation of current waste balances conducted as part of the survey indicates (diagram centre) – residual waste volumes rise significantly as population density increases. Together with the effect indicated in new surveys conducted by the German Federal Statistical Office that Germany's population has been slowly rising rather than falling since 2011, waste volumes for thermal treatment will also increase in parallel with those for material recycling.

The overall impact is reflected in the composition shown in Table 1, applying mean values from estimated ranges. Together with the levels of trade waste not recorded in public statistics, the necessary waste incineration capacity in 2025 might well be the same as today's.

On its completion, the survey was classified by the Federal Environmental Agency as an official expert report. The results have attracted a response throughout Germany in recent months. Invited presentations have already been held at the 27th VDI/ITAD Conference in Würzburg, the Berlin Waste Management and Energy Conference and the 13th Potsdam Conference on the subject of Optimisation of Thermal Waste and Residual Product Treatment. A publication in the specialist waste management journal "Müll und Abfall" is scheduled for May 2016.

(vo)

Tab 1: Potential material flows in 2025 [in million t/a] (excluding trade waste collected by private waste management companies and not recorded in public statistics)

'Traditional' residual waste	RDF* from coal-fired power plants	'New' material flows	Population trend	Total
13,7	0,7	4,1	0,5	19

[1] Waste balances of 16 German federal states and waste management plans from the states of: Baden-Württemberg, Bavaria, Hesse, North Rhine-Westphalia, Rhineland-Palatinate, Saxony, Saxony-Anhalt, Schleswig-Holstein, Thuringia
[2] Waste volumes timeframe 1996 - 2012, German Federal Statistical Office, Wiesbaden, 2014 I *RDF: Refuse-Derived Fuels

CUTEC ON THE ROAD

BERLIN WASTE MANAGEMENT AND ENERGY CONFERENCE

View of the conference hall (source: www.vivis.de)

On January 25th and 26th, 2016, experts in the field of thermal waste treatment gathered for their now traditional conference at the Hotel Berlin. The conference hall was barely capable of holding the large number of attendees (picture 1). A notable aspect once again this year was the presence of many senior management staff from operating companies, plant manufacturers and scientific institutes. The conference covered a range of technical subjects including corrosion protection, waste gas treatment and monitoring; legal aspects such as in relation to the "BVT-Merkblatt" [BREF reference document]; as well as strategic considerations relating to waste management markets. Dr. Vodegel held an invited presentation titled "New input material flows for waste incineration plants through to 2025". The conference demonstrated the high level of interest which thermal waste recovery is again enjoying in Germany. The waste incineration plants and RFD power plants are working to full capacity. Thermal treatment and material recycling are increasingly complementing each other in technical terms, thereby enhancing the optimal utilisation of municipal waste. Legal measures such as comprehensive organic waste collection, amendment of trade waste disposal regulations and the introduction of domestic recycling bins are repeatedly triggering new developments. Interestingly, though, these have not so far led to lack of capacity utilisation at thermal plants, but rather have resulted only in a change of waste composition. The CUTEC Institute continues to offer high standards of R&D resources in the field. (vo)

THE FUTURE OF WASTE RECYCLING FOR ENERGY USE IN GERMANY

Experts from Germany's waste management sector gathered in Bonn on January 21, 2016 at the invitation of the German Waste Management Society DGAW. They considered the
key factors influencing ongoing trends in capacity utilisation at energy-producing waste recycling plants in Germany.

The 80 such plants in Germany are currently working to full capacity according to their operators. And that is set to remain the case over the medium term. Consequently, industrial market players and local authorities are being confronted by rising recycling costs, and are having to adjust their plans.

In the course of the discussion, Prof. Martin Faulstich made it clear that new material flows could be inputted into the incineration plants in addition to the existing ones, commenting: "EU-wide efforts to avoid landfill dumping, the effects of legislation relating to the shift to renewables in Germany and the planned ban on the agricultural use of sewage sludge are delivering additional fuels for energy production. Increased demand will also come from the increasing trend towards urbanisation, as well as rising immigration, entailing potential increases in waste volumes for energy production use." Prof. Faulstich backed up his claims with reference to the results of the survey on "Eco-friendly utilisation of non-established material flows in waste incineration plants" recently published on the website of the German Federal Environmental Agency. (fa)

Prof. Martin Faulstich during the discussion

ERWAS MEETING

On February 2nd and 3rd, 2016 the second status review meeting of the BMBF-sponsored programme to promote future-proof technologies and concepts for energy-efficient water resources management (ERWAS) was held in Essen. All 12 project alliances presented their interim results to interested research scientists and practical applications specialists for discussion.

The programme is investigating new possibilities for optimising water management plants in terms of their energy balances and associated resource use.

The CUTEC Institute's Waste Water Process Engineering working group was involved with two projects ("BioBZ" and "ESiTI") forming part of the ERWAS programme. On the second day of the event, Prof. Michael Sievers presented initial results relating to the development and technical implementation of a microbiological fuel cell in waste water treatment plants. More information:
bmbf.nawam-erwas.de. (si)

13TH CONFERENCE ON OPTIMIZATION OF THERMAL WASTE AND RESIDUAL PRODUCT

For the 13th time, Texocon GmbH headed by its CEO Lutz-Peter Nethe invited waste incineration specialists to their event at the Hotel am Griebnitzsee in Potsdam. The event was targeted primarily at managers responsible for operation of the plants. Dr. Vodegel was invited to give a presentation on "Material flows for waste treatment plants in 2025". The conference focused particularly on matters relating to waste gas emission limits, plant upgrades, documentation, energy efficiency, and mercury and nitrogen oxide reduction. Interest levels were so high that requests to attend even had to be refused, as Mr. Nethe explained with regret in his opening address. In the evening, the host and sponsors invited attendees on excursions to the Berlin-Mitte combined heat and power plant and to the Bornstedt Crown Estate. Thanks to the positive response, plans are already underway for the 14th conference, which will be held from February 22nd to 24th, 2017. (vo)

SCIENTIFIC ADVISORY BOARD

Profile in this issue: Prof. Dr. rer. pol. Jutta Geldermann

Prof. Dr. rer. pol. Jutta Geldermann

Regional cooperation – in this case the axis formed by the towns of Göttingen, Clausthal and Goslar – allied to scientific excellence in different disciplines provide ideal preconditions for successful collaboration. In relation to environmental and energy technology, the challenge is to jointly develop, test and apply innovative services. This was also the motivation of Göttingen Professor Dr. Jutta Geldermann in responding positively to our request for her to join our Scientific Advisory Board. She regards the applications-oriented research of the CUTEC Institute as a valuable complement to her work as head of the Energy Management research department of the Goslar-based Lower Saxony Energy Research Centre (EFZN). Interlinking science and industry, this approach enables results of basic research to be rapidly translated into practicable technologies.

Jutta Geldermann, born in 1968 in Mülheim on the Ruhr, initially served a banking apprenticeship with Deutsche Bank. From 1990 to 1995 she studied business and engineering, majoring in corporate planning, at the University of Karlsruhe (now KIT). That institution was also where she completed her supplementary studies in business training and coaching. She subsequently spent a year abroad at Trinity College Dublin, where she wrote her degree thesis on "Building rubble recycling in Ireland".

Prof. Geldermann then spent 11 years as a member of the scientific staff and habilitation candidate in the Institute for Industrial Operations Studies and Industrial Production (IIP) and in the German-French Institute for Environmental Research (DFIU) at the University of Karlsruhe. She worked on, devised and led numerous research projects, in particular as head of the working group on Technology Evaluation and Risk Management. In 1999 she gained her doctorate (Dr. rer. pol.) with a thesis on the subject of "Development of a multi-criteria decision-making support system for integrated technology evaluation – based on the example of emissions reduction measures in the iron and steel industry". Her habilitation (professorship) in business economics, with a thesis on "Multi-goal decision-making in industrial production", followed in 2005.

In 2006 Prof. Geldermann was invited to take up posts at three German universities: in Bamberg, Berlin and Göttingen. Fortunately for our region, she accepted the post of Professor of Production and Logistics in the Economic Sciences Faculty of the Georg August University in Göttingen. From 2012 to 2014 she was Dean of the Economic Sciences Faculty, with its 33 professors and over 4,500 students. In the period from 2012 to 2015 she was a member of the board of the EFZN. She is also an editor for a number of international scientific journals. In 2013 she was additionally appointed W3-Professor of Energy and Resources Management at the Technical University of Berlin.

Her research work focuses on the resource-efficient and ecologically sustainable design of production and logistics systems, as well as on industrial risk management. The methodology of operations research (mathematical corporate planning) is being applied to current energy management and industry related issues in numerous projects. Her departmental team in Göttingen is interdisciplinary in composition, covering the subjects of business economics, business IT, business and engineering, applied mathematics, geo-ecology and forestry sciences. She is spokesperson of the Graduate College "Resource efficiency in corporate networks – Methods of in-house and cross-company planning for the use of renewable resources", which has been sponsored by the German Research Foundation (DFG) since 2012. (kra)

Congratulations…

From left: Prof. Gaderer, Philipp Sinn, Prof. Faulstich and Prof. Niemann

… to Dr.-Ing. Philipp Sinn, who successfully attained the academic title of Doctor of Engineering on February 19, 2016 based on his public presentation and subsequent oral examination. His scientific dissertation was titled "Comparison of an innovative wave power plant technology with existing power supply possibilities at a decentralised model location".

… to Dr.-Ing. Jana Oelze on passing her doctoral examination on March 1, 2016. Her dissertation, completed while working at the CUTEC Institute, was on the subject of "Efficient power generation from biogas in a SOFC system – Development, characterisation and operating behaviour".

From left: Prof. Gursky, Prof. Faulstich, Jana Oelze and Prof. Heinzel

… to our staff members Ralf Bauer and Kay-Morten Schenk, who in January celebrated 25 years' service. We would like to take this opportunity to thank them for their great commitment and valuable contributions over the years. (wes)

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